

Message

From: Mwangi, George M. (DNREC) [George.Mwangi@state.de.us]
Sent: 6/23/2017 4:10:03 PM
To: Moncavage, Carissa [Moncavage.Carissa@epa.gov]
CC: Rebar Jr., John J (DNREC) [John.Rebar@state.de.us]; Trulear, Brian [Trulear.Brian@epa.gov]
Subject: RE: Formosa pre-notice permit
Attachments: Formosa.FS.Draft_2017.docx; Formosa.Permit.Draft_2017.docx

Carissa,

Revised version of permit and FS attached. The key changes made to address your comments are in red font. Let me know if you have any questions.

George Mwangi

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From: Mwangi, George M. (DNREC)
Sent: Friday, June 09, 2017 9:34 AM
To: 'Moncavage, Carissa'
Cc: Rebar Jr., John J (DNREC); Trulear, Brian
Subject: RE: Formosa pre-notice permit

Carissa,

Formosa started implementing some of the recommendations made from steps 2 & 3. Even though a clear source of toxicity* has not been identified, the test results table (Table 6) shows that there has been improvement. They have not had a failure since April 2016. I agree with you that the statement "if toxicity persists" which is in their approved TRE plan is vague. Since they have started implementing some recommendations, I would consider one more failure in either of the species to trigger step 4. I'll be having a discussion on this with Formosa next week per their request. I'll be calling you shortly.

*Toxicity based on 100% effluent

Table 6 – Whole Effluent Toxicity (WET) Results, As “% Dead” of Test Organisms

Sample Date	Mysidopsis Shrimp ^[1]	Sheepshead Minnow ^[2]	Sample Date	Mysidopsis Shrimp	Sheepshead Minnow	Sample Date	Mysidopsis Shrimp	Sheepshead Minnow
3/8/2010	100%	100%	7/11/2012	0%	0%	2/23/2015	0%	0%
3/10/2010	100%	100%	7/13/2012	50%	0%	2/25/2015	0%	0%
3/12/2010	100%	0%	10/8/2012	0%	0%	2/27/2015	0%	0%
5/10/2010	100%	70.7%	10/10/2012	0%	0%	5/11/2015	0%	0%
8/2/2010	0%	0%	10/12/2012	0%	0%	5/13/2015	0%	0%
8/4/2010	0%	0%	2/4/2013	0%	0%	5/15/2015	0%	0%
8/6/2010	0%	0%	2/6/2013	0%	0%	8/3/2015	0%	0%
12/6/2010	100%	100%	2/8/2013	0%	0%	8/5/2015	0%	0%
12/8/2010	0%	0%	5/6/2013	100%	95%	8/7/2015	0%	0%
12/10/2010	0%	0%	5/8/2013	100%	5%	11/11/2015	0%	0%
3/7/2011	100%	0%	5/10/2013	0%	0%	11/13/2015	90%	0%
3/9/2011	0%	0%	8/7/2013	0%	0%	11/16/2015	0%	0%
3/11/2011	10%	0%	8/9/2013	0%	0%	3/28/2016	0%	0%
3/13/2011	0%	0%	8/12/2013	0%	0%	3/30/2016	0%	0%
6/13/2011	100%	0%	11/4/2013	0%	0%	4/1/2016	100%	0%
6/15/2011	0%	0%	11/6/2013	0%	0%	6/15/2016	0%	0%
6/16/2011	35%	0%	11/8/2013	90%	15%	6/17/2016	0%	0%
10/10/2011	0%	0%	2/10/2014	100%	10%	6/20/2016	0%	0%
10/12/2011	0%	0%	2/12/2014	0%	0%	9/19/2016	25%	5%
10/14/2011	5%	0%	2/14/2014	90%	15%	9/21/2016	0%	0%
11/14/2011	0%	0%	5/14/2014	0%	0%	9/23/2016	0%	0%
11/16/2011	0%	0%	5/16/2014	0%	0%	12/14/2016	0%	0%
11/18/2011	5%	0%	5/19/2014	0%	0%	12/16/2016	0%	0%
1/9/2012	0%	0%	8/11/2014	0%	0%	12/20/2016	0%	0%
1/11/2012	0%	0%	8/13/2014	0%	0%	3/6/2017	0%	0%
1/13/2012	40%	0%	8/15/2014	0%	0%	3/8/2017	15%	0%
4/9/2012	0%	0%	11/3/2014	70%	0%	3/10/2017	5%	0%
4/11/2012	0%	0%	11/5/2014	0%	0%			
4/13/2012	0%	0%	11/7/2014	30%	100%			
7/9/2012	0%	0%						

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From: Moncavage, Carissa [<mailto:Moncavage.Carissa@epa.gov>]

Sent: Thursday, June 08, 2017 3:17 PM

To: Mwangi, George M. (DNREC)

Cc: Rebar Jr., John J (DNREC); Trulear, Brian

Subject: RE: Formosa pre-notice permit

Hi George,

^[1] Mysidopsis bahia

^[2] Cyprinodon variegatus

Thank you for the thorough response to my comments on the Formosa pre-notice permit. I do have one follow-up question regarding the TIE/TRE. In the last sentence in Step 3 you state "Formosa is to proceed with step 4 if the toxicity in the effluent persists" but it is not clear what you mean by "persists". They have repeatedly demonstrated that there is toxicity in their effluent so it seems that instead of waiting for the next failure they would proceed to step 4 now, identifying the source of the toxicity. I would recommend either putting in language that they continue moving forward with identifying the source of the toxicity or define what "persists" means, that is, be more clear as to what will trigger step 4 of the TRE—one more failure of the Mysidopsis shrimp? One more failure of either organism?

Feel free to call me to discuss further.

Carissa Moncavage

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From: Mwangi, George M. (DNREC) [<mailto:George.Mwangi@state.de.us>]

Sent: Wednesday, May 31, 2017 4:32 PM

To: Moncavage, Carissa <Moncavage.Carissa@epa.gov>

Cc: Rebar Jr., John J (DNREC) <John.Rebar@state.de.us>

Subject: RE: Formosa pre-notice permit

Carissa,

I finally got to work on your comments. Let me know if you have any questions on the responses. If not I'll revise the draft permit and FS.

WET related comments

Comment #1

I have gone through the background information and been in contact with permittee in order to respond to your comments. After "failing" the toxicity test (LC50 less than 100% whole effluent), Formosa was required to submit a TRE.

Their TRE involved 7 steps:

- Step 1: TRE plan
- Step 2: Information and data collection and review
- Step 3: Facility performance evaluation
- Step 4: Toxicity identification evaluation
- Step 5: Toxicity source evaluation
- Step 6: Toxicity control evaluation
- Step 7: Toxicity control implementation and follow-up monitoring

Formosa submitted a TRE plan (Step 1) in 2011 which was approved by DNREC. In 2013 they submitted a final report on implementation of Steps 2 & 3 (see details below). A summary will be added to the fact sheet. Based on the final report, a clear source of the toxicity has not been determined. Several recommendations were however made in the report and Formosa is implementing some of them. The "toxicity" is based on LC50 in 100% whole effluent. The proposed permit requires passing at 13.4% effluent and hopefully Formosa will pass the toxicity test at that effluent concentration.

Step 2

Biomonitoring testing reports, DMRs & lab analytical reports, wastewater treatment chemicals and their ecological toxicity data, and utility water treatment chemicals and their ecological toxicity data information were collected and reviewed.

Biomonitoring test results were reviewed to observe any pattern of failure. Two observations were made: 1) Samples with collection ending date with Monday consistently showed toxicity. 2) Mysid Shrimp was more sensitive to the toxicity than Sheephead Minnow. DMR review revealed that toxicity was still present even when the effluent was meeting the numerical permit limits for the regulated pollutants. The usage rates and available ecotoxicity data for the chemicals (coagulants and flocculent) used in the treatment plant were reviewed. The ecotoxicity data for the test organisms used in the biomonitoring tests were not available in the Material Safety Data Sheets (MSDSs). Although the toxicity testing organisms presented in the MSDSs are not the same as those used in the biomonitoring tests, the review found that the coagulant chemical could be toxic to the test organisms at elevated dosage. Chemicals used for cooling tower and boiler feed water treatment were reviewed. The ecotoxicity data for the test organisms used in the biomonitoring tests were not available in the Material Safety Data Sheets (MSDSs). However one of the chemicals' low threshold of toxicity indicates that it could be potentially toxic to the biomonitoring test organisms at an elevated dosage.

Step 3

Manufacturing and production operations at the facility during the biomonitoring sampling periods were reviewed in an attempt to evaluate their potential contribution to toxicity in the effluent. No particular product lines and their associated activities appeared to be clearly responsible for contributing to toxicity in the effluent. Ecotoxicity data of key raw materials available in the MSDSs were also reviewed. A few raw materials have low toxicity thresholds however it was unknown how much of these raw materials would be present in the effluent after production and treatment processes. A red discharge from the production process ("red water") had been identified in a previous TRE (2007) as contributing to effluent toxicity. The red water is produced when the E2 plant is making copolymer products, products with vinyl chloride and vinyl acetate. The water contains low levels of vinyl acetate and its decomposition products such as acetaldehyde and formaldehyde. The "red water" was reported to be treated with hydrogen peroxide prior to discharge into the process wastewater sewer system. With respect to housekeeping, at the time of TRE plan preparation an excess amount of latex materials discharged from production processes had covered the aeration basin. The facility made improvements to its manufacturing process and reduced the latex discharge significantly. The treatment plant process design and operation was reviewed. Observation suggested that complete mixing was not occurring within the aeration basin. The plant operators reportedly adjust coagulant dosages based on their observations of the treated wastewater clarity. It was reported that they began to lower the coagulant dosages incrementally during the TRE steps 2 & 3 period.

After the review of available information discussed above, it was determined that additional analytical information would be needed to adequately conduct the appropriate TRE. Therefore sampling and analysis were planned to collect information about the raw wastewater characteristics, wastewater treatment plant performance and potential toxicants contributing to toxicity in the effluent. This was implemented through a sampling and analysis plan (SAP).

Recommendations were then made based on the observations and findings. Some key recommendations included continue minimizing discharge of latex material from the manufacturing process to the wastewater treatment plant, take measures to keep coagulant dosages within acceptable ranges and ensuring adequate treatment of "red water" before release. Formosa is to proceed with step 4 if the toxicity in the effluent persists.

Comment #2

The table in the fact sheet was missing some 2014 data. The updated table is attached.

Comment #3

Formosa will be required to perform Quarterly monitoring in the first year of the permit. If they pass all four tests in the first year, monitoring may be reduced to annually upon written request. If there is a failure in any of the four tests in the first year, DNREC will evaluate for RP. Limits (and monitoring frequency) will be established if necessary. If there is no RP, quarterly monitoring shall continue until a total of four consecutive test passes have been achieved after which annual monitoring may be requested. Any test failure after the first year of monitoring will trigger evaluation for RP (and possible limits) and will require a TRE.

PCB related comments

Comment #4

Correction will be made.

Comment #5

The special condition 9 "request for monitoring reduction" will be removed and the once per year frequency will remain as the minimum frequency allowed.

A more readable process flow diagram will be requested from the permittee and included in the permit.

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From: Moncavage, Carissa [<mailto:Moncavage.Carissa@epa.gov>]
Sent: Wednesday, January 25, 2017 5:42 PM
To: DeFriece, John R. (DNREC); Mwangi, George M. (DNREC)
Cc: Rebar Jr., John J (DNREC); Ashby, Bryan A. (DNREC); Trulear, Brian
Subject: Formosa pre-notice permit

Hi John and George,

I finally looked over the Formosa permit and have the following comments. Feel free to call me to discuss. Tick tock goes the clock...

WET related comments:

1. There should be more discussion in the fact sheet regarding the outcome of the TRE and final report that was submitted to DNREC. Was the source of toxicity found? Was it resolved?
2. Related to comment #1, what triggered the quarterly testing in early 2015?
3. Generally, EPA's position is that one test failure represents RP for WET, and would require the permit to include WET limits. Considering the proposed new mixing zone dilution, the new IWC and dilution series, imposing a WET limit may not be appropriate. Therefore, we would recommend requiring accelerated WET testing (such quarterly testing) in the first year of the permit and submitting these WET results to DNREC. It is EPA's expectation that DNREC would evaluate these results to determine if there is RP and establish a limit, if necessary. If there is no RP, then DNREC can determine the appropriate frequency for WET testing.

PCB related Comments:

4. Section I. B. (effluent limits table) has the wrong special condition reference for PCBs (PCB is special cond's 8 & 9).
5. Both the fact sheet and permit discuss reducing PCB monitoring after two years of "successful testing", but it is not clear what "successful testing" means. How are you defining successful testing, and what level of reduced monitoring would DNREC consider proposing in the permit? A reduction in monitoring to less than once per year may not be appropriate. According to 122.44(l)(2), requirements to report monitoring results shall be

established on a case-by-case basis with a frequency dependent on the nature and effect of the discharge, but in no case less than once a year. In order to report PCB data once per year, we believe that a monitoring frequency of a minimum of once per year should be maintained in the permit. Additionally, as required in 40 CFR 122.44(d)(1)(vi)(B), WQBELs must be consistent with the assumptions and requirements of any available wasteload allocation for the discharge. In essence, the data collection and PMP permit requirements are the WQBELs that the facility must meet to be considered consistent with the wasteload allocation requirements of the TMDL. Annual monitoring and reporting of PCB data seems like an appropriate frequency for all of these reasons.

The process flow diagram is hard to decipher. Do you have a better, more readable copy to include in the permit?

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